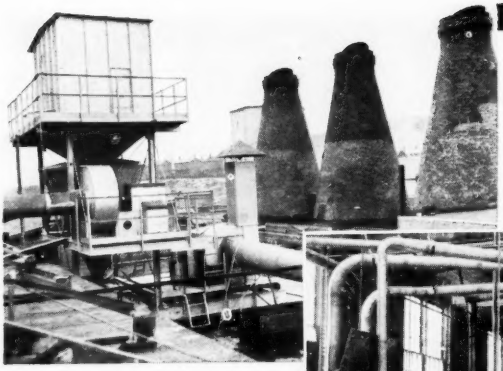
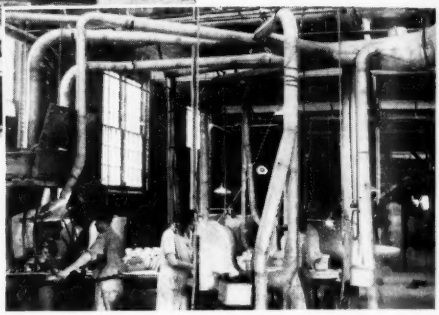
Occupational HAZARDS & SAFETY

Nov. 1938

There's Profit in Prevention



Views of Kirk & Blum installation at plant of large manufacturer of porcelain electrical insulators. System shown below removes dry clay dust and chips from drilling machine and seven other stations around the circular table.



ELIMINATE THE DUST HAZARD!

KIRK & BLUM Dust Collecting Systems are scientifically designed and specially constructed to eliminate the dust and fume menace . . . to keep the air throughout the plant cleaner and healthier with utmost economy.

One-piece, long, radiuselbows, streamline fittings, leak-proof piping, and other exclusive advantages make possible the K & B Guaranteed Suction with low power requirements, and assure long life and years of trouble-free service.

Our Engineers will, without any obligation, make a study of your dust and fume removal problems, and explain how to overcome them efficiently and economically. Details of this service and book of valuable, interesting information will be mailed upon request.

THE KIRK & BLUM MFG. CO. 2802 Spring Grove Ave., Cincinnati, Ohio

Designers and Builders of Dust Collecting, Fume Removal, Ventilating Systems

Chicago Representative: C. P. Guion, 1661 N. Milwaukee
Pittsburgh: The Bushnell Machinery Co., 311 Ross Street
Louisville: Liberty Eng. & Mfg. Co., Inc., 1450 S. 15th St.

KIRK & BLUM
Dust Collecting Systems

VOTE FOR RESPIRATORY PROTECTION

DOUBLE WILLSON

Industry's Choice

BUREAU OF MINES APPROVED *Dual Disc* RESPIRATOR

No. 750, bearing U. S. Bureau of Mines Approval No. 2119 for Dusts and Mists. Inexpensive Throw-Away Filters equally effective in dry or moist atmosphere. Specially molded rubber face piece fits various face shapes. All parts easily and economically replaceable.

X

APPROVED *Rotiform* RESPIRATOR

No. 200 bearing U. S. Bureau of Mines Approval No. 2118 for protection against Type A Dusts. Light and comfortable to wear. Specially designed felt filter provides more than 30 square inches filtering surface. All parts protected for long wear. Easily cleaned. Comfortable form-fitting face piece. For Approved Protection against Lead Dusts, specify No. 200L.

X

TWIN CHEMICAL CARTRIDGE RESPIRATOR . . .

No. 711 for plating operations, brazing, paint spraying, and *very light* concentrations of organic vapors, acid gases and fumes. Can be worn with spectacles or goggles and under Welders Helmets with absolute comfort. Three separate chemical fills—replaceable cartridges. New form-fitting face piece. *Not for carbon monoxide, nitrous oxide, ammonia or atmospheres deficient in oxygen.*

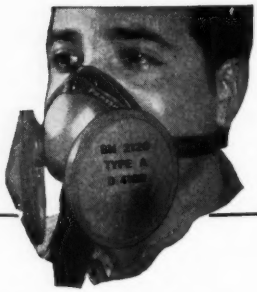
X

Willson Products, Inc., manufactures 8 types of Bureau Approved Respirators and 22 other types. Consult your authorized Willson Dealer for all Respirator needs.

DOUBLE WILLSON

PRODUCTS INCORPORATED

READING, PA., U.S.A. *Established 1870*



PULMOSAN RESPIRATORS

More than 40 types for Dusts, Fumes, Gases, Smoke, Sprays

Consider two angles when buying respirators. First, get the correct type for your danger; second, get a respirator combining highest safety, comfort, ease of breathing and serviceability.

Pulmosan Respirators assure both; the most complete line on the market, offering the most features. Tell us your needs. Get literature.

EVERYTHING FOR INDUSTRIAL SAFETY

Pulmosan can meet all your safety needs; Goggles, Masks, Safety Clothing, Gloves, Chemical Handling, Tools, First Aid, etc. If it's for safety, we have it.

Let us quote on ALL your safety needs

PULMOSAN

SAFETY EQUIPMENT CORP.

Dept. OH

176 Johnson St., Brooklyn, N.Y.

UNDER this heading it becomes our prerogative to let off a little steam about the Silver Jubilee Safety Congress and Exposition held in Chicago October 10-14. It could simply be said that this year's Congress celebrated 25 years of safety work; was the greatest, at least in point of attendance; and was well planned and smoothly conducted, and let it go at that. But more should be said, both favorably and unfavorably. From the Exhibition Hall in the lower lobby of the big Stevens Hotel to the tower rooms in the uppermost regions there was much of value to see, hear and do.

Let's start at the bottom and go up. Not because this is the usual procedure but because if this year's Silver Jubilee Congress was dedicated to 25 years of progress in accident prevention, and had as its theme "285,000 lives saved," then in the booths of the 115 exhibitors could be found visible and realistic evidence of why and how that record has been achieved. It was evident from the manufacturer's exhibits of safety equipment and health products that he has kept pace with, yes, even anticipated, those industrial hazards which exist today and may exist tomorrow as a result of the new machines, materials and

methods being developed every day.

It isn't possible in this space to tell you about all the products so graphically displayed. If a worker would have entered the exhibition hall he could have received a complete examination for his physical fitness; equipment for testing vision, hearing and strength was displayed. He could have been adequately and properly equipped to work safely in almost any industrial hazard. If any of his fellow workers received a scratch or minor injury he could have received proper treatment from the first aid equipment shown. Furthermore, when his day's work was completed, the worker could have washed, taken a shower (there were plenty of soaps and towels on hand) and changed clothes for his homeward journey. Perhaps that will give you an idea of the scope and nature of the products displayed.

Some safety pins picked up at the Congress . . . Mr. Whiting's effective demonstration of the hazards of gases with his human "Guinea pigs" . . . Mr. Harrington's letter addressed to the Bureau of Mines for information on birth control . . . power press machines stamping out spurious coins as souvenirs . . . the largest boot in the world (size 168) . . . welding with cartridges . . . washing in the big circular cement basin . . . the diorama on the hazards of lead poisoning . . . oh, yes, the brunette in kilts passing out samples.

If any one word could describe the Congress as a whole it might well be the word "earnestness"—earnestness in planning, in purpose and in participation. Every meeting was exceptionally well attended and the audience

DREDNAUT

Welding Goggles

Fitted with Drednaut (U. S. Navy Specifications) lenses provide welders with complete protection against the dangerous invisible ultra-violet and infra-red rays in cutting, brazing and welding operations.

Drednaut Welding Goggles are further equipped with Non-Rubber Headband—the only one of its kind on the market that eliminates completely all the unpleasant annoyances so prevalent in the old style elastic headbands.

We also manufacture a complete line of leather and asbestos gloves, aprons, sleevelets, coats, and pants, as well as many other items of safety for industrial plants.

Our new big 100-page general Catalog No. 10-B illustrates and describes our full line. Write for your copy today.

JOBBERS—: Write for full details of our distributor proposition.

SAFETY EQUIPMENT SERVICE CO.

1228 St. Clair Avenue

CLEVELAND, OHIO

HOLD THAT CAR
With
M & M RAIL CLAMPS

BRACING car wheels with wood blocks is dangerous and often costly.

M & M RAIL CLAMPS

the safest and surest possible stop for car wheels—they provide safe conditions and guard against accident and property damage.

M & M RAIL CLAMPS

are recommended for use on runways in repairing cranes, on loading platforms, temporary sidings, etc.

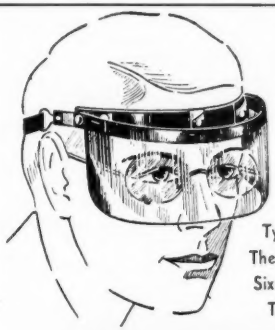
Style 0—$15.00

INDUSTRIAL PRODUCTS COMPANY
Accident Prevention Equipment
783 W. Somerset St. Philadelphia, Pa.

in each meeting stayed to the end, even buttonholing the speakers afterward for a final question or answer. Many were unable to gain admittance to some of the sessions because the meeting rooms were already filled. This was no fault of the committee but rather reflected the interest of the delegates and the sincerity of their desire to hear and learn.

This speaks well for the men and the women who are actively engaged in the work of health and safety in industry. And this speaks well for the future progress which will be made in this field. The results of the efforts of men and women working with this spirit are bound to spell SUCCESS in bold letters.

Industry must be fully prepared to present an intelligent and constructive program, and be adequately equipped to meet whatever conditions may arise both in the recognition of industrial disease hazards and their prevention. Knowledge of all phases of this subject is vital to industry.



Type C
There Are
Six Other
Types

JACKSON Eyeshields

At last!
Comfortable, Effective Eye Protection!

Workmen *like* these shields—wear them willingly. They're economical, durable, available with clear visors and four different colors. Other types of eyeshields for a wide range of uses. Write for folder.

JACKSON ELECTRODE HOLDER CO.
15120 Mack Avenue Detroit, Michigan

OCCUPATIONAL Hazards and Safety

Vol. 1, No. 2

CONTENTS FOR NOVEMBER

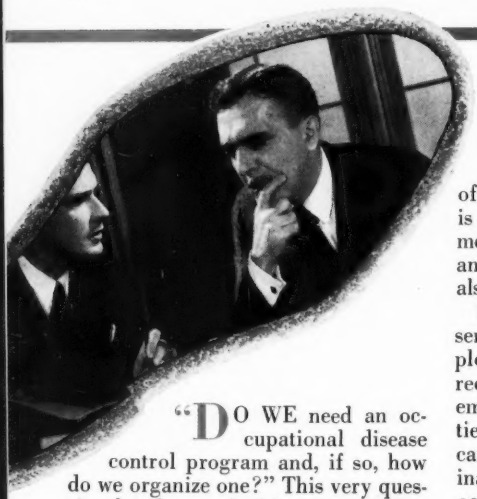
	Page
The Safety Valve	2
The Three Steps	6
"Relief Work" in a "Dust Bowl"	10
Looking at It the Other Way	13
Carrying the Torch for Safety	17
Get the Lead Out of Your Workers	22
Watch for the Dollar Sign	27
This Month in Washington	30
On the Record	32
New Products in the Field	34
Useful Free Literature	37
The Question Box	39
Nine Dollar Words	40

Copyright, 1938, THE INDUSTRIAL PUBLISHING CO. Published Monthly
812 Huron Rd., Cleveland, Ohio

Ting S. Hexter, President
P. Asbach, Vice-President
R. C. Walker, Editor
E. J. McFadden, Asst. Ed.
G. B. [illegible], Production Mgr.
Alfred G. Reefer, Representative
Harold Steffens, Representative

THE THREE STEPS
towards an Occupational
DISEASE PROGRAM

By WILLIS G. HAZARD
Owens-Illinois Glass Co.

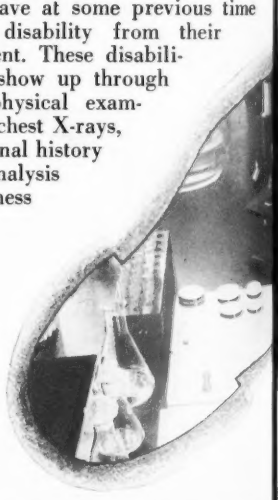


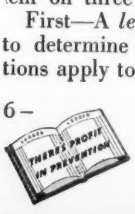
"DO WE need an occupational disease control program and, if so, how do we organize one?" This very question has been asked by many industrial concerns when they become occupational disease "conscious" for the first time. Unfortunately, the "first time" too often follows, rather than precedes, epidemic of industrial diseases.

After determining sources of information and help, a company should attack the occupational disease problem on three fronts:

First—A *legal* survey is conducted to determine what statutory regulations apply to the working conditions of the plant and what the employers liability is in the case of occupational diseases. The Air Hygiene Foundation has made a complete digest of the regulations of the forty-eight states and this digest is kept up to date by periodic supplements. Federal and state labor, health and industrial hygiene bureaus can also supply this information.

Second—A *medical* survey is essential to determine whether any employees have at some previous time received disability from their employment. These disabilities will show up through careful physical examinations, chest X-rays, occupational history and an analysis of sickness



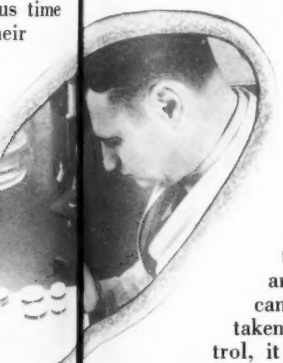


experience of a department where a hazard is suspected. (All of these four points are important and should be carried out in the beginning in order to provide a proper foundation upon which a control program may be built.)

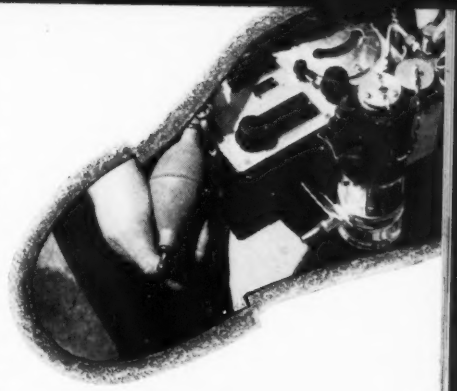
Third—An *engineering* survey is needed to determine the condition of the work rooms and the materials and equipment handled. This survey includes a measurement of air-borne dusts, gases and vapors and present means of ventilation. (It should take into account all production operations and the handling of materials.)

The obvious purpose of these three surveys is to show if and to what extent hazards exist and what changes or improvements are needed in mechanical equipment or operations in order to control hazards.

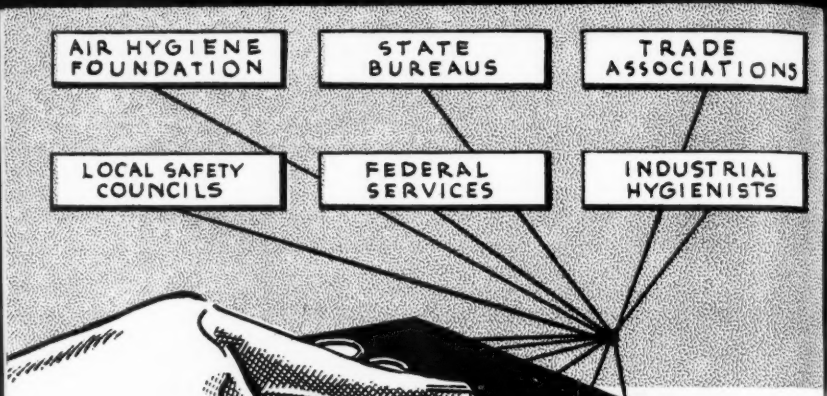
Costly injuries to health result from many a delay in instituting remedies, to say nothing of permitting danger signals to go unheeded entirely. Once the plant has determined what hazards exist, where and to what extent, and what measures can and should be taken for their control, it is essential that these controls be inaugurated at once.



Until recent years it was assumed that only larger firms could organize and carry out industrial disease control programs. I say "assumed" because it was generally felt that only the larger plants could afford to initiate and maintain the personnel, equipment and methods necessary for the success of such a program. Experience and records show, however, that many smaller companies did maintain, to the best of their ability and resources, control programs that proved worthwhile and economical. Be that as it may, today the small plant is much more fortunate in initiating its study, looking toward the control of occupational disease hazards, than it has been in the past. Much more is known about these hazards—their causes, effects and remedies—and, furthermore, the knowledge is more readily available to the newcomer in this field.



One of the first sources of information to which a plant may turn in an investigation of its conditions is its trade association. Many of these associations, of which the American Foundrymen's Association and the Portland Cement Association are typical outstanding examples, are well equipped to render valuable service in this respect. The Air Hygiene Foundation of America, Inc. of Pittsburgh is an institution devoted entirely to



the study of this subject and which has available a wealth of technical data and consultation experience that are invaluable.

Other important sources of information are Governmental bodies—federal, state and local. The Public Health Service, Division of Labor Standards and the Bureau of Mines of the Federal Government have made broad studies on this subject and are constantly endeavoring to be of assistance to industry in the control of occupational diseases. Many states have formed bureaus of industrial hygiene which perform a distinct service to industry. The work of these bureaus includes visiting plants, upon request, analyzing conditions and suggesting measures which may be taken to control conditions which are hazards, or potential hazards.

In addition to these sources are the industrial hygienists, who are specialists in studying the effect of working environment on employees and adequately prepared to recommend and carry out effective control programs. Many companies find that they can achieve the most successful results by employing the services of industrial hygienists on a full time basis. This field is a growing one and there are more and more consultants becoming available.

Last, but not least, as a source of information regarding the organization of your program is the experience of other concerns in your field of operations. Nothing is more valuable than experience and the actual application of control methods. You will save yourself much time, effort and money if you will study the problems of other firms employing the same materials, equipment or methods and determine if the remedial measures taken by those plants will

prove satisfactory for yours. Case histories and experience records are generally available and no doubt you can find one of these which is applicable to the conditions in your plant.

Carrying on the Program

AN occupational disease program, after being organized, is of no practical value unless it is carried on continuously. Time after time, either in genuine concern over employees' health and welfare, or for some other reason, a plant has become tremendously excited over industrial hygiene for a year or two and then forgets it.

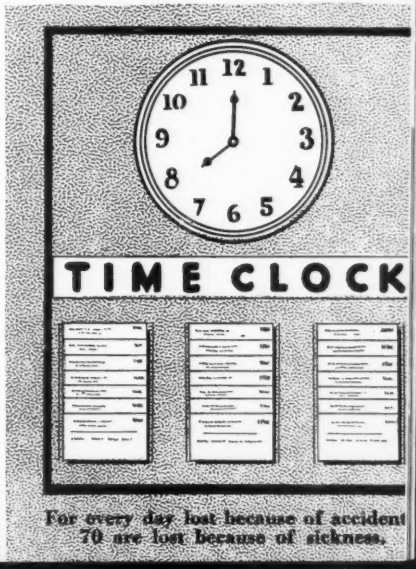
Not only should the initial investment in new equipment be protected by regular inspection and servicing, but personnel and educational activities must continue hand in hand for a well-rounded, successful program.

Therefore, one other factor must be added to the legal, medical and engineering phases of this subject—that of administration. The administration of an occupational disease program and the dovetailing of it smoothly and effectively into the company structure is perhaps one of the greatest pitfalls of all. The occupational disease program should be made an integral part of the plant's entire safety program. Top management must be thoroughly sold on the value of such a program and this acceptance must permeate down through the administrative organizations to superintendents, foremen, and workers.

Absenteeism

Occupational disease "consciousness" has stirred the interest of many companies in a new, but related, field —absenteeism, the concern over lost time from sickness of all kinds. Beyond the dollars and cents cost of occupational disease compensation (in those states where occupational diseases are compensable) absences because of general sickness present an opportunity for constructive personnel and medical work. For example, a five year study of major disabilities in a plant employing several hundred women showed that, for every day lost because of an industrial accident, seventy days were lost because of non-industrial sickness. This find, as far as available records show, is not at all unusual, but rather typical. The purpose of the study of such absenteeism is in no way connected with treatment of disabilities, but to find ways of preventing this disability—of promoting, as Dr. Selby of General Motors has said, health maintenance.

Any plant, large or small, will find a study of absenteeism profitable. Medical records should be kept, with a card for every employee and absence.



For every day lost because of accident 70 are lost because of sickness.

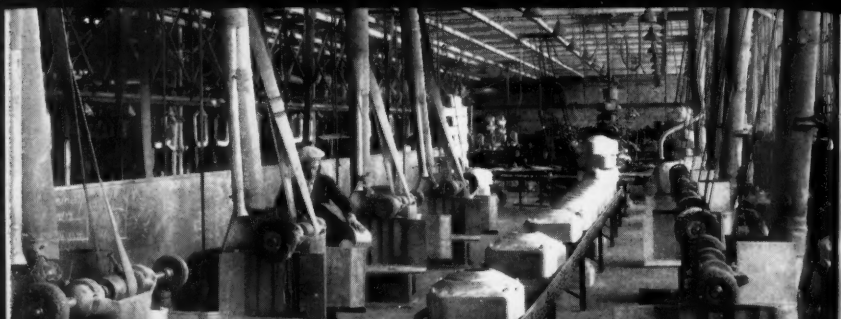


Photo Courtesy Kirk & Bl

Unit system dust collection in Maytag grinding and polishing department.

"RELIEF WORK" IN A "DUST BOWL"

Production jumped 20% for the Maytag Company following installation of dust collectors.

GRINDING, polishing and buffing are important operations in almost every metal-working plant and such operations are bound to raise "a lot of dust." The presence of dust in an atmosphere where employees work and breathe, particularly if it be a toxic dust, constitutes a serious occupational hazard. Thus, the removal of dust is not only essential for the protection of machinery and equipment and for plant cleanliness, but also for the workers' health.

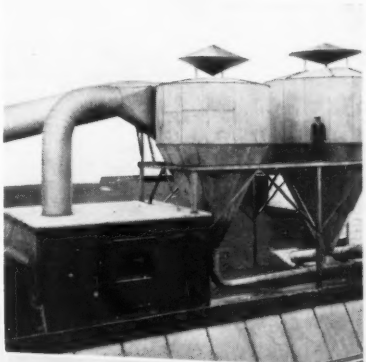
Grinding and polishing some 15,000 aluminum castings each day presented a problem to the Maytag Company's Newton, Iowa plant which was solved successfully with the installation of a modern blower system. Two tons of dust were collected every nine hours from 120 polishing lathes and 40 belt grinders. An old dust collection system in the grinding and polishing department worked, but due to increased production and changed conditions it was inadequate to take care of the grinding and polishing equipment. Twenty-two grinding and polishing operations on each tub and nineteen operations on each crown called for an efficient blower system to provide the most healthful working conditions possible.

The system installed is simple in operation and requires but little attention for maintenance. In order to control the dust at its source, suction hoods of various sizes and shapes,

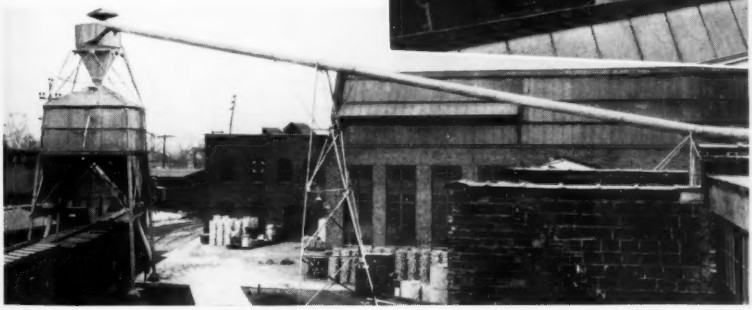
depending upon the nature of the operation, were installed on each of the machines and all other equipment connected with the system. Actually there are three "systems," each serving a section of the room in which the grinding and polishing operations are conducted.

Three 90-inch fans on the roof maintain an average suction of 4½ inches static pressure. Two of them are double fans driven by 75-hp motors. The third is of the single type and is operated by a 40-hp motor. All three have a speed of 400 r.p.m. By the use of these three fans, the dust is sucked through a network of pipe leading from the machines and is blown into three large cyclones. A fourth blower, which has a 50-inch fan and is operated at 900 r.p.m. by a 25-hp motor, picks up the dust from the tanks and relays it some 100 yards to an overhead hopper. This hopper has a capacity of two full carloads and the dust is loaded into railroad cars through the bottom of the hopper.

What results have been achieved with the installation of this modern blower system? With the better working conditions obtained production speed has increased approximately 20 per cent in the polishing and grinding department. Formerly, a collection of two tons of dust was reached in a nine-hour operating day, requiring the services of six men, working on a schedule of eleven hours each night, to sweep and clean the room. The services of only two sweepers are now required for the purpose of cleaning the department.



Right-High speed, 90-inch fans draw the aluminum dust and abrasive to these roof cyclones. Below-A separate blower charges this railroad siding hopper of two carload capacity.



THERE'S PROFIT IN PREVENTION

It was found that the aluminum dust mixed with fine particles of abrasive was very harmful to the machinery installed in the room. It worked its way into the bearings, with frequent breakdowns and costly repairs resulting. The new blower system has eliminated this to a great extent and cut maintenance costs proportionately.

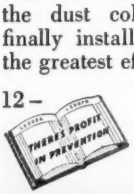
Over and above these important advantages is the fact that the working conditions of the employees in this department have been so greatly improved that absenteeism has been reduced to a minimum, and the workers are better satisfied. The natural result of this is improved quality of workmanship.

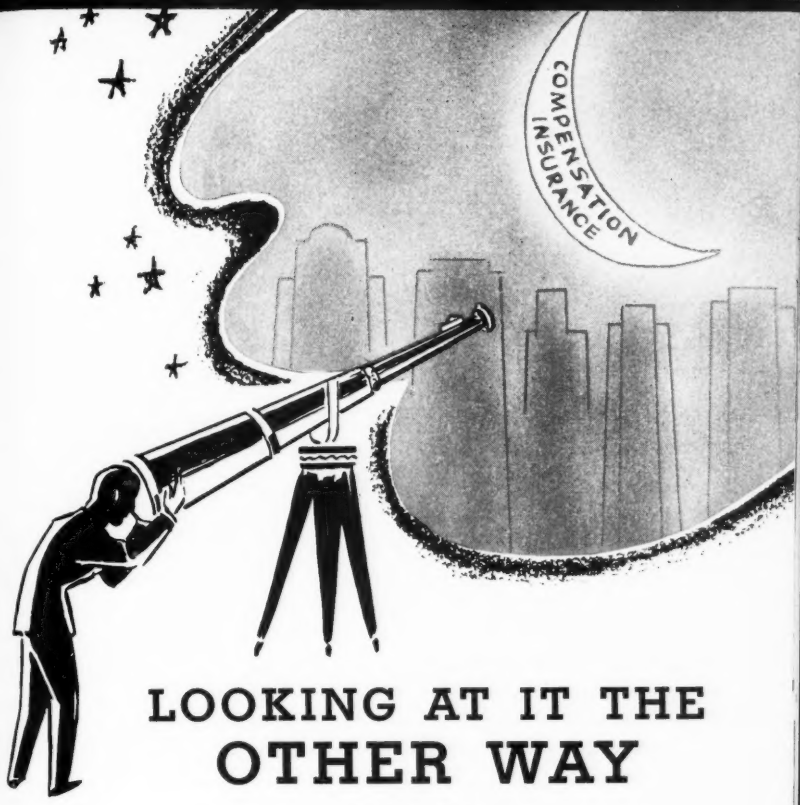
The installation of a modern blower system at the Maytag plant is a splendid example of how the elimination of a potential hazard pays dividends not only in the health and welfare of employees but also in lower costs and increased production.

One of the basic principles in dealing with a dust hazard is that the dust should be attacked at the point of origin and thus prevented from being disseminated into the atmosphere. In order to achieve this desired result it is necessary to take into consideration various forces and factors regarding the nature of the operations being performed, the age and type of equipment being used, and the manner in which equipment must be installed to overcome any space limitations or peculiar position of machinery. Unless all these points are considered in advance it cannot be expected that the dust collection equipment finally installed will work with the greatest efficiency.

Due to the rapid drop in air velocity away from the face of the hood, it is essential to place the hoods as close as practical to dust creating operations. In carrying dusts from the operation into the dust collection system, it is important to determine in what direction the air should flow. For example, heavy dusts are best handled by employing downward currents of air into a hood, while light dusts are normally best handled by hoods utilizing an upward flow of air. If either of these two methods is not practical, then a cross or lateral draft may prove adaptable. In many cases equipment representing a large investment is prevented from efficient operation simply because air currents in a room and currents created by the machinery being operated have not been studied. The dust collection equipment is not at fault in such cases.

In order to avoid such possibilities it is a wise policy to employ the services of recognized manufacturers who will conduct thorough engineering surveys and make recommendations to insure the installation of the most efficient equipment according to the conditions which exist. Furthermore, periodic check-ups should be made to make certain that the system is functioning adequately. Increased production or changes in operating methods may affect the amount of dust generated or the air currents. It has been well stated that industry has found that the best way to treat industrial injuries and illness is to prevent them. And the best way to prevent them is to install efficient equipment and maintain it at a safe margin of efficiency. Good maintenance is less expensive than repairs.





LOOKING AT IT THE OTHER WAY

By JOHN F. IDLER
Zurich General Accident & Liability Ins. Co.

WHEN the first workmen's compensation laws were enacted in the United States, almost twenty-five years ago, the main objective in the minds of the legislators was to provide prompt medical and financial aid to injured workmen. It was to be expected that, among other things, these laws would stimulate safety or accident prevention movements because excessive or severe accidents would mean high insurance costs to the employer. Such efforts did follow and with outstanding results. However, due to the nature of the subject and the laws, and the ramifications of the questions involved a long period of time had to elapse before proper adaptation and correlation of schedules, rates, liability, premiums, reserve funds, administration and other factors could be achieved.

A similar and parallel situation has developed today with the broadening

Workers of the "non-serious risk" class, for whom medical or engineering inspection was long considered unnecessary, now present definite insurance problems in view of the many new compensation laws.

of workmen's compensation laws to include occupational diseases as compensable injuries. The questions arising from the passage of these acts interest and affect employer, employee, safety engineer, industrial hygienist and the insurance underwriter.

Tendency Factor

FROM the time when casualty underwriters took over the duties and liabilities of employers subject to workmen's compensation laws it was observed that some workers were more prone to injury than others. It was recognized that among the causes of this fact were differences in mental alertness, deficient eyesight, impaired efficiency due to existence of venereal diseases, and so on down a list of a dozen or more reasons why poor physical condition of workers cause mishaps. These facts were included in the cross-sectional picture of considerations the insurance companies took into account when making rates for the underwriting of workmen's compensation insurance. At that time, however, primarily because there did not exist a great amount of information on the subject, no profound consideration was given to the hazards which might have been undermining workers' health.

It is true that the processing of lead and its compounds, for instance, was generally known to be a hazard, and the existence of diseases like miner's phthisis, anthrax, glanders, dermatitis and others had been catalogued years before, but the effect of the exposures causing occupational diseases, as we know them today, was not foreseen, at least to the extent of recognizing the legal implications of establishing causal connection between the worker's physical well being and his work. Consequently, in the early days of rate making for workmen's compensation insurance no contingency loadings for silicosis, the use of hydrocarbon solvents, caisson disease, radium poisoning, asbestosis and the like were originally contemplated.

Neither had the medical, engineering or legal profession fully equipped themselves with sufficient knowledge to cope with these situations as they must now be dealt with under the provisions of occupational disease legislation.

With respect to the problem of underwriting occupational disease risks the subject can be divided into two parts, non-serious risks and serious risks.

Non-Serious Risks

The question of determining a rate that industry can afford to pay for risks in this class has been generally simple. The non-serious class of risks includes such classifications as inservants, clerical office help, salesmen, wholesale stores, miscellaneous and mercantile manufacturing concerns. At the present time it is the consensus of opinion of underwriter, doctor and engineer that risks of this nature can be written without engineering or medical inspection as prerequisite to binding of coverage. There is a definite feeling, however, that an over-all loading for all possible types of occupational disease claims for all industries should be included as part of the specific rates applicable to any given operation. This is justified on the premise that there is still an unknown immeasurable quantity that can be finally determined only after a lapse of years from the time the new legislation on occupational diseases has become effective.

Serious Risks

Exposures such as are encountered in woodworking plants; spray painting operations; machine shops; some of the sheet metal trades, especially where there is some likelihood of new development programs involving unknown manufacturing or compounding treatments; foundries; smelters; stone-cutters, where there is apt to be an accumulation of damages to the health of workmen over a period of years of employment on account of the previous existence of unsanitary and dangerous conditions, which might be summed up in the appropriate phrase "accrued liability"; present difficulties to the underwriter that

The existence of "accrued liability" in such "serious risk" workers as these, under the new laws forces special insurance precautions.

are surely trying and sometimes practically insurmountable.

The primary step is to take an inventory by means of medical examination. and X-ray if necessary where it is possible to do so, or else depend upon the published statistics, both mortality and morbidity, in the given industry under which the risk is classified. If the resultant potentialities indicate a fruitful field for claims, especially if the locale is one where exploiters are likely to flourish, it is then necessary to study the employer-employee relations and, assuming they are favorable, the next step is to weigh out the financial stability of the prospective assured. A firm destined to be out of business within a short time either on account of impending bankruptcy or due to the temporary nature of the work in hand, such as a construction project, does not present a too favorable picture for the underwriter and his ingenuity will be taxed to handle the risk on any basis.

An exposure by a group of workers in the asbestos industry for a period of twenty years must command the attention of the underwriter not only in making of arrangements for safeguarding the workers' well being because of past working environments, but also in looking into the future. The employer must prove his capacity to be able to improve the plant facilities and designs so that occupational disease hazards are reduced to an absolute minimum degree. Individual industries, of course, can afford to pay an amount for insurance rates and plant improvement that lies within the range of a profit margin.

The insurance carrier, on the other hand, can assume only that measure of liability that comes within the limits of the rate charged. It is true that eventually that price levels in a given industry will have to be raised to care for this social change in legislation. In the meantime it is the function of the underwriter to bring about a settlement of the question by means of a temporary rate setup within the limits of the employer's ability to pay in premium and the insurance carrier's ability to write for such premium in order to bridge the gap until sufficient reserves have been built up for an orderly procedure as between the assured and the insuror. In some states new laws have been passed in such a fashion as to accelerate the accomplishment of this end. In other states so-called "all inclusive" acts have been passed which immediately allow the injured person full benefits the same as he would have obtained in the event it was a pure case of workmen's compensation with no occupational disease involved.

THERE is one fundamental difference between the underwriting of Workmen's Compensation and Occupational Disease risks that should be observed. The original theory of applying a series of credits in the rates for Workmen's Compensation insurance based on a schedule of standards for the safeguarding of machinery was proved less important in many cases than analyzing the plant management's attitude toward safe practices, and so we found many times that whereas a risk may not have been up to par from the physical standpoint, the experience nevertheless was good because the management had their own and an efficient system of instilling safety in the minds of their employees.

Welding with either torch or arc is an open-flame process. Careful observance of safety rules would prevent many fires attributable to this process.

Carrying the Torch for Safety

Cardinal safety points in welding and cutting work

By Allan Kellock
The Linde Air Products Co.

THE recent observance of National Fire Prevention Week makes timely a discussion of the prevention of fires and of safe practices to be followed in the operation of welding and cutting processes.

Welding with either a flame or arc is obviously an open-flame operation. Consequently, welding by any process or gas cutting should not be undertaken in any place where it would be forbidden to light a match or otherwise set up a source of ignition. The same rule should apply to any other operation involving intense heat, such as riveting and soldering.

In both forms of welding sparks and hot slag are formed and these molten globules of metal and metal oxides can fly appreciable distances; also the hot stub ends of welding rods or electrodes may be dropped. Such hot materials may possibly start smoldering fires if precautions are not taken to prevent them from lodging in combustible materials in the vicinity of the operation or in the cracks of wooden floors. Two good rules to follow are: (1) sweep floors clean and dampen them down before starting work, and (2) use sheet metal guards or asbestos curtains where needed.

Protective shields should be provided to guard floors against hot slag and sparks.

Operations at Elevated Points

WELDING and cutting operations that take place at elevated points in building structures require special precautions against the falling or flying of hot metal slag and sparks. It is almost an impossibility for the operator himself to know where these hot particles are going, and therefore a competent person should keep an eye on that part of the work. After any welding or cutting operation is completed, it is well for the operators or foreman to look over the area and make sure that there is no smoldering fire anywhere in the vicinity.

Welding on Closed Containers

Another problem that is not in itself directly due to fire but is inherent in the heat of welding or cutting is the bursting of a container, hollow casting or the like that is not vented. Such articles may be relatively small, and the unvented space may involve only a few cubic inches. However, increased temperatures will cause the pressure in these confined spaces to rise, and when the strength of the weakest part of the wall has been exceeded, it will burst. Frequently this occurs because of the reduced strength of the metal at the point where it has been heated practically to the fusion point. Containers should be vented at a regular opening and a hole should be drilled into any hollow object where no cap or plug can be removed to provide a suitable vent.

Confined Combustible Gases

There is another fire hazard of welding or cutting operations. This is the ignition and possible explosion of combustible gases or vapors in containers through failure to remove the vapors and their source before beginning the hot work. Because of the size of many of these spaces, such as the compartments of oil tankers, double bottoms of oil-burning vessels, the inside of gas holders, and large pressure storage tanks, fires or explosions would be of major magnitude, if they should occur.

It must not be forgotten that smaller containers such as barrels or automomobile gasoline tanks offer the same hazards as these larger containers. Fortunately, there is a safe, inexpensive way in which smaller containers can be prepared for hot work. The first step after cleaning and flushing out the container is to place it in such a position that the part to be worked upon is uppermost. The container should then be filled with water to within an inch or two from the point

where the heat is to be applied. The water not only reduces the space in which gas or vapors might collect to a very small part of the total, but also tends to clean the container. In addition, the water keeps the container from overheating, thus reducing the possible volatilization of any residues which may be present.

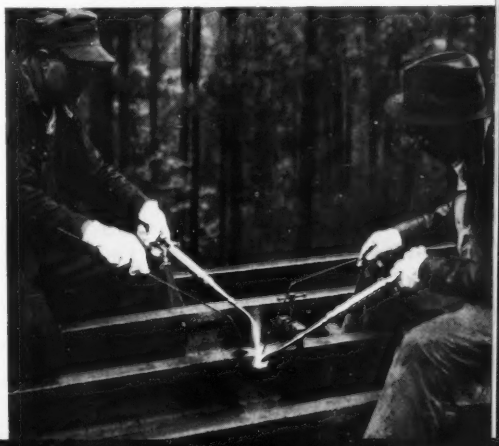
Containers are frequently steamed in an effort to purge them of hazardous materials. Caustic solutions are helpful in removing grease and oil. Where this operation has been standardized and the repair work is done immediately after the steaming and cleaning is completed, the hazard will be helpfully reduced.

Purging With Inert Gases

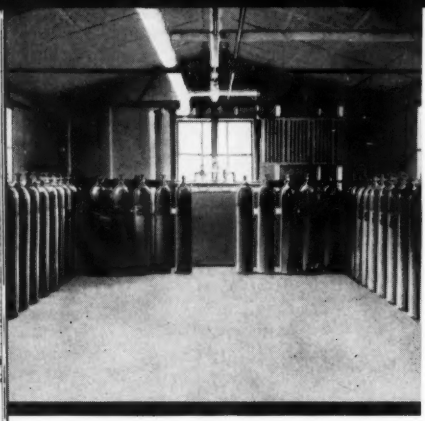
The use of carbon dioxide gas or nitrogen for purging tanks is satisfactory provided it is known that the air that was contained in the container has been displaced by the inert gas to a point where ignition cannot occur. This can only be determined by making a gas analysis. Combustible gas detectors are available which are capable of taking samples from any container and accurately testing them. This determination is very useful, but does not necessarily insure that when heat is applied there will be no further generation of combustible gases or vapors which might materially affect explosive conditions unless tests are made at frequent intervals during the course of the work.

Another hazard which may result when welding or cutting inside confined spaces is the possibly deficiency of oxygen. Any heating operation uses up oxygen of the atmosphere, and many years ago the famous Davy lamp was developed to indicate not only the presence of flammable gases but also insufficient oxygen in the air to support life.

Oxygen from cylinders or pipe lines should never be added to confined spaces in an effort to compensate for the oxygen that is consumed in heating operations however, because increasing the oxygen concentration in any atmosphere materially adds to the possibility of igniting clothes or other combustible materials.



Important parts of a welder's protective equipment are good gloves and goggles, together with adequate protective clothing. In arc welding, the use of shielding helmets and leggings is also wise practice.



Sensibly planned storage of welding supplies, such as this, contributes very materially to both safe and efficient use.

Proper Care and Use of Apparatus

Closely allied with the subject of fire prevention and welding hazards is the proper care and use of welding and cutting apparatus. Following prescribed practices and routines is just as important in the operation of welding and cutting apparatus as it is in other industrial operations, as for example, those involving the use of manufactured gas or electrical equipment. The equipment should comply with the standards of underwriting laboratories and be preferably of a type listed by Underwriters' Laboratories, Inc., or approved by Factory Mutual Laboratories.

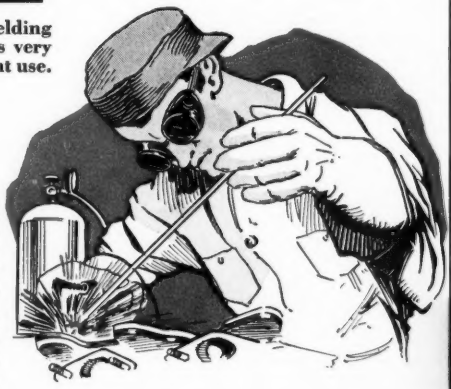
Care of Regulators

Regulators are necessary for reducing cylinder pressure to the desired working pressure and to maintain this lower working pressure constant at the blowpipe burning tip.

They should be protected against small particles of dust and dirt getting inside where they may seriously interfere with efficient operation. Before attaching a regulator to a cylinder, the cylinder valve should be opened for an instant to blow out any dust and dirt that may have accumulated in the valve opening.

Repairing Hose

There is only one satisfactory method of repairing welding and cutting hose, and that is to cut the hose and insert a union. Repairs with tape should never be attempted. It is a good plan to examine all hose carefully at least once a week for leaks, worn places, and loose connections. This can easily be done by immersing the hose in water while under pressure. Old, worn hose should be discarded entirely. After any leaks have been repaired and connections made tight, the hose should be blown out to remove any particles of the lining which may have worked loose.



Blowpipe Operation

When lighting a blowpipe, always follow the manufacturer's directions, and make sure that the regulators are adjusted to the proper pressure.

Cylinder Handling

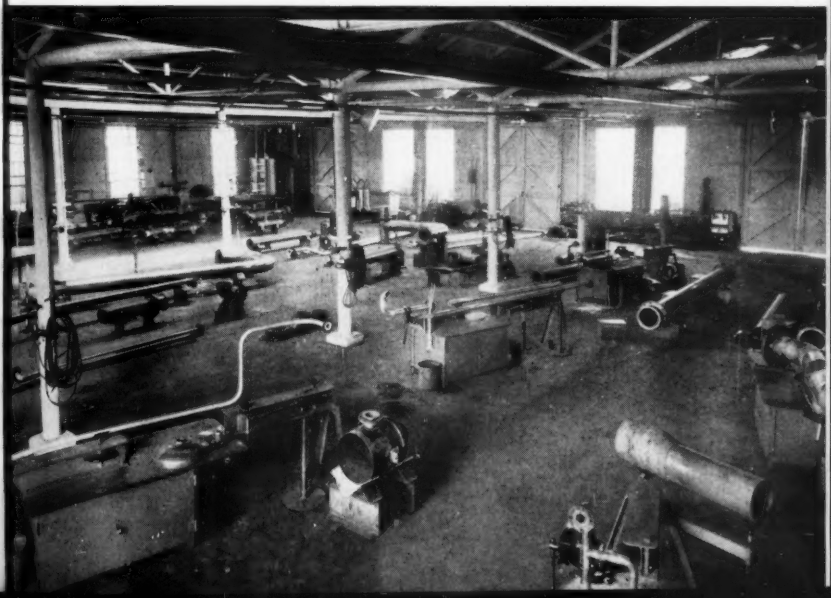
Important among the precautions to be observed in the handling of cylinders are: (1) prevent their falling from any height or striking each other violently; (2) use only a cradle, "boat" or suitable platform (never a magnet or sling) when transporting cylinders by crane or derrick; (3) avoid using cylinders as rollers or supports even if they are considered empty: (4) place cylinders where they will not come into contact with hot slag or flame from the welding or cutting operation; (5) When not to be used for appreciable lengths of time, the valves should be closed; and (6) Do not store near radiators, furnaces, fires, or other sources of heat, nor leave exposed to ice or snow in winter, or to direct rays of summer sun.

Operator Protection

When engaged in welding or cutting, the operator should be provided with adequate protection for his body against the heat of the work, and from particles of hot metal that may fly from the operations. Properly colored and designed lenses fitted in suitable goggles must be used to protect the eyes. The selection of the goggles should be in the hands of a responsible person who fully understands the importance of proper eye protection.

Clothing should be maintained in good condition. Woolen clothing is preferable to cotton because it is not so readily ignited. It is advisable that outer clothing be relatively free of oil or grease.

Clean floors and walls, good light, ventilation and adequate room make this a model welding shop layout.



GET THE LEAD OUT OF YOUR WORKERS

Lead poisoning is as insidious as halitosis, and a lot more dangerous. There's no known cure, only treatment and prevention.

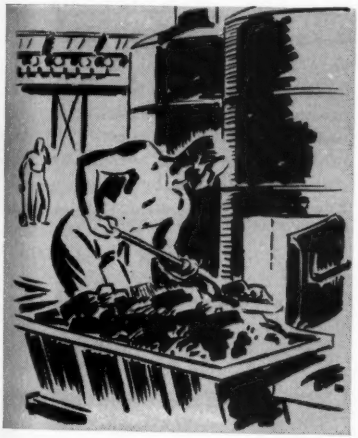
By KENNETH MORSE
Industrial Hygienist

LEAD poisoning is not a disease of recent discovery. Ancient Greek and Latin physicians were aware of the fact that lead would cause colic if swallowed. Following the building of the aqueducts in Ancient Rome, lead pipes were used for the domestic distribution of water. There was such an epidemic of people suffering from the use of lead contaminated water that Vitrivius, a noted Roman architect, was moved to condemn the use of the metal. So widespread was an epidemic of suffering among workers in the lead-using industries, particularly the pottery trade, in England in the latter part of the 19th Century that a special commission was appointed to determine the cause of the illness and to recommend ways of preventing it. Another interesting commentary in this connection is the fact that in 1910, among the regulations drawn up by the Commissioner of Industrial Hygiene, in France, for the lead smelting and refining industries was included a provision which prohibited employees working barefoot in the shops.

The hazard involved in handling lead and its compounds was one of the first recognized health hazards in industry. As such, lead poisoning has been the subject of extended study and research to determine causes, symptoms and effects; and the object of many rules and regulations looking toward its prevention.

As a result of years of study and effort there has been a marked decline in both the frequency and severity of lead poisoning cases in the past quarter of a century. The death rate from lead poisoning in the

United States, for both occupational and non-occupational cases, declined from 2.5 deaths per million of population in 1900-04, to 1.0 death per million in 1936, or a decrease of 60 per cent. This decrease as been the result of a combination of several factors, among which are: progress in diagnosing and treating cases; sanitary improvements in industry; better personal hygiene and bodily cleanliness habits on the part of workers; and the growth of the principle of occupational disease compensation, placing the liability for such diseases upon industry.



Notwithstanding the progress which has been made, when we consider the fact that in 1936 there were 96 deaths from lead poisoning in industry in the United States, and that 112 cases of occupational lead poisoning were reported in the state of Ohio alone that same year, we realize the importance of continued efforts to eliminate this hazard.

Industrial health hazards are often ignored or overlooked until some epidemic focuses public attention directly upon the dangers. Two recent examples of this were the epidemics among workers producing or blending tetraethyl lead, in 1923, and the abnormal number of cases reported in the automobile industry in 1934. Following such outbreaks great impetus is given efforts to provide safeguards and to introduce protective and preventive measures. However, the very nature of the disease, lead poisoning, demands constant and consistent remedial efforts for its successful elimination and prevention.

Scope of the Hazard

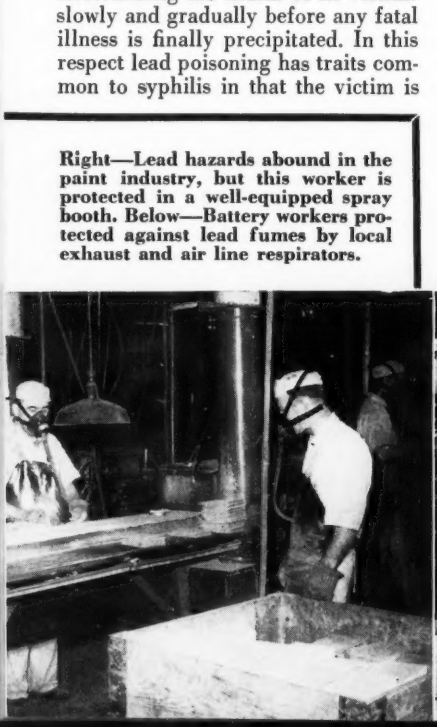
Lead poisoning is not confined to any one particular occupation or industry, or to any particular locality. It is estimated that 110 industries and some 900 specific operations or processes expose workers to lead absorption. There is no community so small that it doesn't include at least one painter. And statistics show that this occupation is one of the major sources of the disease. Obviously, the amount and type of lead compounds used, the manner in which they are handled, the equipment in which they are processed and the health protection afforded are important factors in determining when a potentially hazardous occupation actually becomes hazardous to the health of the worker. However, for the sake of absolute safety, it should be stated that the use of lead or its compounds in any form and to any degree is sufficient reason to take every possible precaution and to institute every possible protective measure.

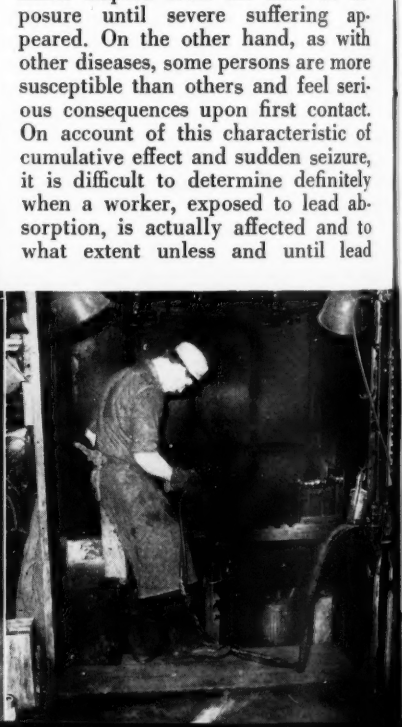
A knowledge of what lead poison-

ing is and how it is contracted is of greatest practical importance in order to have an intelligent system of safeguards and adequate protective measures. Briefly and simply, lead poisoning is a chronic disease affecting the nervous and urinary systems and resulting from the presence of lead salts in the body beyond the point where the system can eliminate them naturally and normally. While lead poisoning is always preceded by lead absorption, lead absorption is not necessarily followed by lead poisoning. Symptoms of the disease may be noted long after actual exposure has terminated. Workers may continue to work for years while absorbing lead daily without actually suffering from its action on the system. Lead poisoning is an insidious or subtle disease, undermining the health of its victims slowly and gradually before any fatal illness is finally precipitated. In this respect lead poisoning has traits common to syphilis in that the victim is often unaware of the fact that he is a potential victim of the disease even though he is gradually absorbing lead particles into his body. Furthermore, due to the fact that lead poisoning works slowly in tearing down the system and in weakening the constitution, it is often unsuspected as the first or contributing cause of serious illness or even death. Its work is done when it has undermined the system sufficiently to permit some resulting disease to complete the work started. For this reason, lead poisoning is oftentimes referred to as the "knock down" disease, while another illness following is called the "dragging out" disease.

It was found that in the English pottery trade an average period of 18 years for females and 22½ years for males elapsed from the time of exposure until severe suffering appeared. On the other hand, as with other diseases, some persons are more susceptible than others and feel serious consequences upon first contact. On account of this characteristic of cumulative effect and sudden seizure, it is difficult to determine definitely when a worker, exposed to lead absorption, is actually affected and to what extent unless and until lead

Right—Lead hazards abound in the paint industry, but this worker is protected in a well-equipped spray booth. Below—Battery workers protected against lead fumes by local exhaust and air line respirators.





poisoning sets in. Therefore, it is wise to conduct periodic inspections of workers and working conditions.

It is generally agreed today that a lead hazard exists in any plant or workroom where the air breathed by the worker contains lead in excess of 1.5 milligrams per ten cubic meters of air. It is also recognized that there are three methods by which lead may enter the body:

(1) Inhalation—the breathing of air containing excessive amounts of lead dust or fumes. This is by far the chief cause of lead poisoning, and causes more rapid contraction of the disease and more severe cases due to the fact that inhalation carries the lead particles directly into the circulatory system of many workers.

(2) Ingestion—consuming lead particles through the mouth by handling food or tobacco with lead-smeared hands.

(3) Absorption—through the skin, especially when handling tetraethyl lead or working with liquids containing water-soluble lead salts.

In view of the fact that the major cause of lead poisoning is inhalation one of the most important steps to take in safeguarding workers is to install exhaust ventilation and provide plenty of fresh air at all times. However, this alone is not sufficient in all cases. The Division of Labor Standards of the Department of Labor has suggested several ways of safeguarding workers.

Employer Responsibilities

1. Remove lead dust and fumes at their origin by exhaust ventilation. Use wet processes where practicable.
2. See that all workrooms are well supplied with fresh air.
3. Keep all lead compounds in tightly closed receptacles.
4. Provide clean, efficient respirators only for limited exposure.

Operators of smelters, foundries, forges and similar plants should be wary of lead poisoning hazards.

5. Floors and work benches should be vacuum cleaned, otherwise use only wet brushing and sweeping. Cleaning should be done preferably after working hours. Floors should be of cement or other non-absorbent material, to allow thorough cleaning.
6. Supply individual towels, showers, hot and cold running water, separate lockers and separate lunch rooms.
7. Test workrooms regularly for excessive lead in the air.
8. Have periodic medical examination of all lead workers at least every six months.

Employee Responsibilities

1. Have a medical examination before working in lead processes.
2. Brush your teeth at least daily after work.
3. Wash your hands and face well before eating and after work.
4. If showers are available, take a shower after work.
5. Do not bring food into workroom and do not eat in workrooms.
6. Do not exchange respirators with other workers.
7. After illness, due to lead, return to work only with a doctor's permission.

Acceptance of and adherence to these safeguards will do much toward eliminating the hazard of industrial lead poisoning.

BASICALLY providing both the cause and cure of the majority of cases of dermatoses, chemistry plays as vital a role in every phase of industrial hygiene as it does in industrial manufacturing processes. Photograph by Jack Crawford.

Watch for the Dollar Sign On Dermatoses Cases

The second of a dermatoses series, this article points out the need of correct diagnosis of origin

By Louis Schwartz, M.D.
Medical Director, U. S. Public Health Service

THE compensation laws in many of the States are so worded that if a physician undertakes to treat a worker and he makes a diagnosis that the disease is of industrial origin, then his fee is practically taken care of either by the Compensation Commission or by the insurance carrier. But if after treating the patient the physician should determine that the dermatitis is not of industrial origin, the employer or insurance carrier will not pay for the treatment and the physician must look to the patient for his compensation. You can readily see that this has a tendency to make the physician lean towards a diagnosis of industrial dermatitis because very often his chances of being paid a fee by the poor worker is uncertain. It is to the advantage of insurance carriers and Compensation Boards to devise means to remedy this condition.

Workers may have inflammations of the skin due to causes other than the hazards of their occupation. Therefore, it is important to determine whether a dermatitis from which a worker is suffering is of industrial origin—first, because it has a direct bearing on the treatment of the case and on the prevention of its recurrence. Second, because of the compensation involved, and third, in order to determine who pays the physician's fee.

If it can be determined that the dermatitis is due to exposure to certain occupational skin hazards, then the major portion of the treatment consists in preventing further contact with these hazards. That is, removing the patient from his working environment, or providing him with suitable protective clothing. In these cases the prevention of the recurrence of the disease consists in preventing contact with the offending material either by methods stated above or by installing proper safety measures, such as totally enclosed processes, adequate ventilation, clean work rooms, clean clothing, etc.

Hypersensitive workers may not, immediately upon coming in contact with an irritant, develop a dermatitis. A period of time usually elapses. This period may vary from a few hours to a few days. Some workers develop only a mild dermatitis and are able to continue working and finally they become immune. Others develop so severe a dermatitis that it necessitates their discontinuing work. These usually do not develop an immunity. The immunity, if developed, in most in-

stances lasts only a short time—from a week to a month after discontinuing work. There is one class of worker, and fortunately this type is rare, who after working without any trouble for many years, suddenly become sensitized to the materials which he formerly handled with safety and develops a severe dermatitis. These workers never become immune. They may even develop a polysensitivity to many of the ordinary materials of daily life and as a result suffer from chronic, incurable eczemas.

A simple classification of the actual causes of industrial dermatoses is as follows.

1. *Mechanical and Physical:* Under this heading we have such conditions as cuts, abrasions and pressure. The latter two may cause painful calluses as occur on the hands of the glass blowers from handling heavy blowing iron. Heat, which may cause scalds in the wet form and burns in the dry form. Cold, which causes such conditions as chilblains and frost bites in workers exposed to the weather.

Radiation, both artificial and natural, as from the x-rays and radium which causes severe burns and cancers among technicians and radiation from the sun which causes characteristic changes in the skins of such workers as sailors and farmers.

2. *Chemical Irritants:* These may be divided into general irritants and specific irritants. The general irritants are those which will irritate the skins of all individuals. The specific irritants are those which will irritate the skins of certain hypersensitive individuals. The general irritants may be divided into inorganic and organic. The inorganic irritants can be subdivided into acids and their salts, alkalis, and the salts of irritant metals. The principal inorganic irritant acids and their salts are sulphuric, nitric, hydrochloric, hydrofluoric, chromic and arsenous. The principal irritant alkalis are sodium and potassium hydrate and carbonate and calcium oxide and calcium hydrate. The principal metals which have irritant salts are mercury, chromium, nickel, silver, zinc, arsenic, antimony and phosphorous.

The principal organic general irritants can be divided into organic acids and their salts and organic solvents. The principal organic acids which may cause dermatitis are oxalic, carbolic, cresylic, formic, lactic, acetic, malleic, hydrocyanic, phthalic, and abietic. The principal organic solvents which may cause dermatitis are the various alcohols, turpentine, benzol, carbon bisulphide, carbon tetrachloride, trichlorethylene, amyl acetate, butyl acetate, toluol, gasoline and solvent naphtha.

3. *Specific Irritants:* These cause dermatitis only among certain hypersensitive individuals. Many dyes and their intermediates are skin irritants. Aniline oil, nitro compounds, compounds of naphthalene, benzidine, benzanthrone and many of the sulphonic acids. Certain of the dyes cause dermatitis—fur dyes among which are paraphenylenediamine, para amido phenol, aniline black. Leather dyes among which are amido azo toluene, amido azo benezene, Bismarck Brown, and Negrosine.

Photo developers often cause dermatitis. The principal one is metol. Others are paraphenylenediamine and pyrogallol. Soaps often cause dermatitis because they contain free alkali, especially when

mixed with water and also because some of them contain certain substances, such as phenol or cresol, in order to make them disinfectants, and they also sometimes contain perfumes which may irritate hypersensitive individuals.

Many fabric dyes have been reported to have caused dermatitis. I can not give a full list of them, but some of the principal ones are Crystal Violet, Malachite Green, Methyl Violet, Victoria Blue, Victoria Green, Metanil Yellow, Chrysoidine, Auramine and a great many of the dyes which require chrome mordants.

The rubber compounds and their impurities often cause dermatitis. Wild rubber, that is, rubber obtained from wild rubber trees in the forest and gathered by native labor and smoked or cured over fires using certain nuts, contains many of the products of combustion, such as phenols, acetic acid and the tarry matters all of which are potential skin irritants. Plantation rubber is also cured by smoking, but only the surface of it contains the products of combustion and this is easily washed off before the rubber is used for manufacturing purposes. Many of the compounds used in rubber are skin irritants. The accelerators, substances which are used to hasten the vulcanization of rubber are often the causes of skin irritation among rubber workers. The principal accelerators which have caused dermatitis in the rubber industry are hexamethylenetetramine, commonly called "Hexa," the guanadines, tetramethylthiuram disulphide, commonly called "tuads," mercapto benzo thiazole, commonly called "Captax," and triethyl trimethyl triamine, commonly called "Trimene." Para and Ortho toluidine have also caused dermatitis. Anti-oxidants are also used as compounds of rubber in order to prevent the rotting or oxidation of rubber. Phenyl Beta naphthylamine is one of the common rubber anti-oxidants which sometimes causes dermatitis, especially if it should "bloom" out of the rubber.

Many of the insecticides and fungicides are skin irritants. The compounds of mercury, arsenic, fluorine, nicotine and pyrethrum are the principal irritants in this class of chemicals.

Explosives are also irritants to a considerable number of workers. Some of the principal offenders among the explosives are trinitro toluene, tetra nitro methyl aniline, trinitro resorcin, fulminate of mercury, picric acid and its compounds and styphnic acid and its compounds.

Dermatitis may also arise in the manufacture and use of cosmetics. Many cosmetics contain irritant dyes and the essential oils used in cosmetics and perfumes are nearly all irritants if used in sufficient strength.

The vegetable and the mineral oils are also frequent causes of dermatitis. In machine shops and among mechanics the cutting oils and the cutting compounds are the chief offenders. Petroleum distillates, such as gasoline and lubricating oils also cause dermatitis among garage men, automobile mechanics and in other occupations.

"THE ACCEPTED STANDARD OF MERIT"

PLY

FOR PREVENTION OF INDUSTRIAL SKIN DISEASES

SEND FOR FREE DESCRIPTIVE BOOK

MILBURN CO., DETROIT, MICH.

DISTRIBUTORS IN ALL PRINCIPAL INDUSTRIAL AREAS

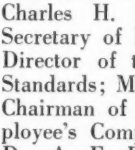
This Month in Washington

By W. T. CAMERON
Chief Safety Adviser, Division of Labor Standards
U. S. Department of Labor

THE title of this feature might well be temporarily changed to "This Month In Chicago"; for the Silver Jubilee Safety Congress and Exposition held in the Windy City the week of October 10-14 called between forty and fifty government officials from their desks in Washington.

Our old friend and fellow worker, Dan Harrington, of the Bureau of Mines was much in demand and evidence at the Congress. In addition to presenting a paper on industrial explosion hazards he was called upon for suggestions, comments and criticisms in every meeting he attended. Charles H. McLaughlin, Assistant Secretary of Labor; V. A. Zimmer, Director of the Division of Labor Standards; Mrs. Jewell W. Swofford, Chairman of the United States Employee's Compensation Commission; Dr. A. E. Russell, of the Public Health Service; Dr. Morton G. Lloyd, of the Bureau of Standards; F. L. Ahern, of the National Park Service and Chairman of the Federal Interdepartmental Safety Council, and your correspondent were among the government officials who participated in the various sessions of the Congress.

The opportunity which the Silver Jubilee Safety Congress and Exposition presented to government officials was well appreciated. The Federal Government is only one of many forces working with a common problem and toward a common goal—safety. Personal contacts afford a splendid chance to discuss mutual problems and to get the other viewpoint. The interchange of ideas and views in the Congress meetings (and outside the meetings, too) between government officials, safety engineers, industrial hygienists, labor, manage-



ment and public officials proved, as always, mutually beneficial to all concerned with industrial safety.

Of the many activities undertaken by your government in the control of accident and health hazards those of the Public Health Service are particularly noteworthy. Through its Division of Industrial Hygiene the Public Health Service is making field investigations, engaging in laboratory research, and consulting with industry and labor groups, and with State and city officials.

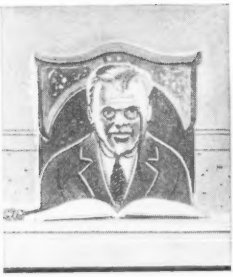
The Division of Industrial Hygiene of the Health Service has prepared a bulletin on the results of a medical study of 2516 potters, and an engineering and chemical study of 9 factories in which these potters were employed. Inasmuch as the last study of this nature in the industry was made 19 years ago, this recent study should be of unusual interest and of real practical value. Among some of the significant results shown by the study are that although lead poisoning is (in the pottery industry) now no longer a hazard, more than three-fourths of the clay shop workers employed for more than 30 years were found to have silicosis. For workers exposed to dust concentrations in excess of four million particles per cubic foot, silicosis is a definite hazard.

A medical study of 800 workers engaged in the manufacture of lead storage batteries, and engineering studies of the workers' environment in ten plants were made by the Division of Industrial Hygiene and the results are now being prepared for publication. The survey covers 25 per cent of the lead storage battery industry by number of employees. In view of the fact that this industry is one of the largest industries using lead this report should be extremely valuable. It will provide a basis for determining the effect of lead on the workers in this industry and the nature of the hazards involved in the workers' environment.

A lead poisoning diorama, one of many Federal Government field aids in the industrial hygiene fight.

THE stimulus provided by the organization of the Federal Inter-Departmental Safety Council has not only made the federal agencies more safety conscious, but already the move has resulted in the desire of government agencies concerned with industrial safety to be increasingly more helpful to industry. With the Federal Government more conscious of its own health and safety problems and taking more specific steps for the welfare and safety of federal employees, it is to be expected that a closer, more co-operative relationship will be developed to enhance the success of our efforts.

Every person interested in and concerned with occupational hazards and safety, and industrial health and hygiene is urged to become better acquainted with the work the Federal Government is doing and the reports which are being made in these fields.



ON THE RECORD

By HILTON E. ROBERTS

Briefs of recent court decisions on matters pertinent to workmen's health and accident compensation.

New Jersey Makes Award for Heat Exhaustion

THE husband of the claimant, an electrician, was engaged in repairing a broken bridge cable. The day was exceptionally hot and the work heavy. The worker became ill and was taken home before the end of the day's work. He died the next day from heat exhaustion. None of the deceased's fellow workmen, nor any other employee occupied in the immediate vicinity of his work at the same time, suffered from the heat.

The Court held that death was the result of heat exhaustion which was a direct consequence of the work upon which the deceased was engaged. The fact that other workers were not similarly affected, although working under the same conditions, was held not to disprove liability. The Court ruled that the conditions of employment and the general health of the individual must be considered. *Douglas vs. Riggs Disler Co.* (Aug., 1938) 1 Atlantic (2nd) 207. (New Jersey).

Court Construction Broadens Compensation Acts

The trend in industrial compensation law is to be found in two directions: First, in new laws passed by state legislatures; second, in the decisions of the courts interpreting laws, both old and recent.

The following cases are indicative of the present trend of court construction with reference to compensation acts.

The Supreme Court of Appeals of West Virginia said in a recent case: "The underlying purpose of the Compensation Act is to provide a system whereby injuries due to industry may be liquidated and balanced in money in the course of consumption. So, in the interpretation of the law, the interests of the public, as well as those of the employee and employer, are to be considered." *Mains vs. J. E. Harris Co.* (March, 1938) 197 S. E. 10 (West Virginia).

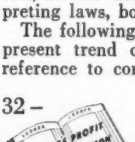
The West Virginia case clearly makes the compensation act of that state a matter affecting the public welfare.

The United States District Court for the western district of New York in construing the Longshoreman's & Harbor Worker's Compensation Act, said: "The act is remedial, and where there is doubt it should be resolved in favor of the injured employee. The act must be liberally construed." *Grain Handling Co., Inc., et al. vs. McManigal, Deputy Compensation Commissioner, et al.* (May, 1938) 23 Fed. Supp. 748 (U. S. District Court W.D., N.Y.).

The construction of the New York District Court gives the benefit of any doubt in compensation cases to the employee.

"Scope of Employment" Given Broad Interpretation

In a recent case decided by the third department of the Appellate Division of the New York Supreme Court, an award was made for the death of an employee occurring while he was playing baseball.



The deceased had been detailed by his employer to organize a baseball team in a league sponsored by the Chamber of Commerce and the Y.M.C.A. The employer paid the entrance fee for the team, furnished the equipment, and the uniforms of the players bore the employer's name. The decedent was designated manager and was required to be present at practice and at games. While engaged in playing, the deceased was struck on the head and received injuries which caused his death.

The award made by the Industrial Board was affirmed by the court which agreed with the finding of the Board, that the injuries sustained "arose out of and in the course of the deceased's employment." *Huber vs. Eagle Stationery Corp., et al.*, (May 1938) 4 N. Y. S. (2nd) 272. (New York).

Iowa Compensation Without Disease Law

Although Iowa excludes coverage for occupational diseases in its workmen's compensation legislation, a recent case in that state resulted in a court decision being rendered in favor of a claimant who had contracted lead poisoning from his work.

The claimant in this case was an automobile mechanic who used a blow torch in his work. Tetraethyl gasoline was furnished as the fuel for the torch. As a result of inhaling noxious fumes over a period of two years, the claimant suffered from lead poisoning. He claimed the employer was negligent in not supplying some other fuel which would not have thrown off the noxious fumes. The company contended that no award should be made because lead poisoning was an "occupational disease," and, therefore, not compensable in Iowa.

In affirming an award made by a lower court, the Supreme Court of Iowa stated: "Where an employer fails to provide a reasonably safe place to work, or fails to observe the specific requirements of the statute with respect thereto, and as a result the employee is injured, the liability of the employer cannot be avoided by calling the injury an 'occupational disease,' or by showing that a disease of that nature is often the accompaniment or result of such employment, even when all due care has been exercised by the employer." *Black vs. Creston Auto Co. et al.* (Aug., 1938) 281 N. W. 189 (Iowa).

Compensation for Cancer Caused By Blow

A pastry cook in a cafeteria of the defendant company sustained a blow on her left breast while operating a food mixer. Fourteen months later cancer developed which necessitated removal of the breast. The Court sustained an award for total disability, finding a causal connection between the blow and the cancer despite the conflicting medical testimony on the question of whether or not trauma could cause cancer. *Melancon vs. Chrysler Corp.*, 284 Mich. 360, 279 N.W. 861 (June, 1938) (Michigan).

CESCO devotes their efforts entirely to head and eye protection equipment. That's one reason why our line of goggles, spectacles, masks, respirators and shields are preferred. They provide maximum protection with wearer comfort. Write for descriptive literature.

CHICAGO EYE SHIELD CO.
2300 Warren Blvd., Chicago, Ill.

New Products

NEW SO_2 RECORDER

CELL corrosion and acid mist, obstacles to successful SO_2 measurement, are eliminated in the new Micromax SO_2 recording equipment, according to an announcement of the Leeds & Northrup Co., 4934 Stanton Ave., Philadelphia, Pa.

Using a standard, glass, measuring-cell assembly, in which corrosion and catalytic action are avoided, the recorder holds its calibration continuously. An efficient filter removes sulphuric acid mist. It is claimed that the cell assembly operates for weeks without attention. Changes in humidity do not affect calibration and the use of the equipment permits a continuous gas sample to be drawn from the flue immediately after it leaves the burning chamber. The gas, freed from sulphuric acid mist and SO_2, is measured with improved thermal-conductivity equipment. The circuit is operated entirely by ordinary A.C. current.

The new Mayflower-Lewis portable humidifier for low cost air-conditioning.

HEAT FAG PREVENTIVE

As an economical and efficient way to stop "heat fag" and the resulting "production lag," the Morton Salt Company of Chicago, has produced an unusually convenient and economical salt dispenser. Providing workers handy access to salt in the form of rapidly dissolving tablets, the dispensers are finding marked acceptance for winter use in foundaries, steel mills, forge shops, oil refineries and other branches of industry in which workers encounter high temperatures regardless of the season.

AUTOMATIC FLOOR SCRUBBER

A new automatically self-propelled floor scrubbing machine has been announced by the Lincoln-Schleuter Floor Machinery Company, 217 West Grand Avenue, Chicago, Illinois. This new streamlined Lincoln Auto Scrubber is designed to scrub and dry large floor areas in one-third to one-fourth the time required by hand mopping and ordinary floor scrubbing methods.

Some of the features claimed for this new scrubber are an automatic control panel with a variable speed regulator to enable the operator to regulate the driving speed of the machine from 90 to 160 feet per minute; a free-floating automatic squeege to pick up water in low spots and to conform to all floor irregularities; and an automatic brush tension control to enable the operator to use a greater pressure on extremely dirty areas and less on cleaner surfaces.

IN THE FIELD

The new Nitrometer-Acid Mask produced by Industrial Products Co., 738 W. Somerset St., Philadelphia, Pa. is primarily designed to protect chemical workers against bursting nitrometer bulbs but gives equally valuable protection to eyes and face in any type of acid operation.

PAPER CUSPIDORS

A new cuspidor, made of heavy paper and thoroughly water-proofed has been announced by the Burnitol Manufacturing Company. This sanitary receptacle is designed to replace metal cuspidors and eliminate the disagreeable work of keeping metal containers clean and sanitary. The "Burnitol" is wire-stitched, rigid and substantial, about 6½" x 6½" at the top and 3" deep.

"OVERALL GOGGLES"

Sellstrom Mfg. Co., 615 N. Aberdeen St., Chicago, Illinois, announces a new "overall" goggle, specifically designed for the man who must wear his prescription glasses while at work. An adjustable, easy-fitting headband is attached to a light weight fabric cap. This supports the goggles by means of a two-point hinge that allows the goggles to be raised away from the eyes without interfering with regular glasses. It is claimed that this device can be worn for hours without slightest discomfort from pressure or tension.

STANDARDIZED GLASS

Development of eight standardized shades of Cobalt Blue Glass is announced by the American Optical Company, Southbridge, Massachusetts. The new glass can be ground and polished to standard thicknesses, a refinement designed to reduce eyestrain resulting from surface irregularities when the glass is drawn or blown. The glass was developed as an aid to open hearth furnace operators to reduce eyestrain and to permit the use of the same shade and color of cobalt blue glass at all times.

Where heat measuring instruments such as thermocouples and pyrometers are not practical to use, the cobalt blue glass is used as a means of determining temperatures and conditions of melts. The glass aids in this visual control in the following ways: (1) by transmitting extreme blues and reds, a slight temperature change, shifting the color temperature of the furnace and materials is readily noticeable; (2)

the opacity of the cobalt blue glass in the yellow region of the spectrum removes the yellow flare from feldspar and other fluxes and gives a clear view of the furnace and its contents; (3) due to temperature and radiation characteristics of slag and metal, the working of the furnace and the interaction of the refining ingredients can be studied and controlled by observation through the glass.

The new Chemical Cartridge Respirator of Willson Products, Inc., 419 Thorn St., Reading, Pa., designed brazing, plating, paint spraying and light organic and acid vapors. Low-resistance, replaceable cartridges make the mask both easy and inexpensive to use.

GAS-FIRED HEATER

A new gas-fired unit heater, operating without steam or water and completely self-contained, has been introduced by the Automatic Gas Steam Radiator Company, 454 Brushton Ave., Pittsburgh, Pa. In addition to heating, the unit may be adapted for ventilating, cooling, drying and other such purposes. It is suitable for use in such commercial and industrial buildings as stores, garages, laundries and small manufacturing plants. The unit is suspended from the ceiling, and employs natural or manufactured gas for fuel.

NEW KIND OF GAUZE

General Bandages, Inc., Chicago, Illinois, has developed and is marketing a new kind of gauze for all types of bandaging.

This new kind of gauze is called Gauztex and is pure white surgical gauze treated with a special solution to make it cohesive. Sticks only to itself.

On the market only a short time, Gauztex is said to have gained a wide acceptance in the medical profession and in general industry.

NEW BONDING MATERIAL

A new cellulose processed primer, announced by the Flexrock Company, 800 N. Deleware Ave., Philadelphia, Pa., is designed to give greater bonding strength, better cementing properties, and to grip firmly on almost any surface. It is claimed that this new primer will withstand tremendous vibration and therefore may be used where machinery causes excessive movement in a floor. Another advantage set forth for the primer is that it will securely attach linoleum, rubber tile, asphalt tile, cold mastic and other floor materials.

TIE CLASP EMBLEM

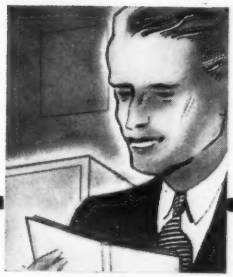
Something new and attractive is offered by the Williams Jewelry and Manufacturing Co., Chicago, Ill., in the way of a safety emblem that is suspended from the tie clasp. Any type award emblem can be mounted on the clasp, depending on the nature of the safety program conducted. Special emblems can be wrought in precious metals if desired.

EXTINGUISHERS FOR CLASS A AND B FIRES

Walter Kidde & Company, Bloomfield, N.J., have announced an improved line of water and anti-freeze portable fire extinguishers. A cartridge of compressed carbon dioxide gas is used to expel the water or anti-freeze solution, and advantages claimed for these extinguishers are that they require no annual recharging, discharge only clean water, do no acid or chemical damage, and are of long life owing to the absence of corrosive ma-

[*Continued on page 38*]

USEFUL FREE LITERATURE



Copies of any of the publications described may be obtained through use of the coupon on page 38.

033—UNIT HEATING REQUIREMENTS

Complete ratings, prices, speeds, constants and dimensions for unit heaters are tabulated in detail in a new folder issued by Carrier Corporation, Syracuse, N.Y. The information is presented in tables and drawings, helpful in determining requirements for unit heating.

034—AUTOMATIC SHUT-OFF VALVE

The D. J. Murray Manufacturing Co., Wausau, Wisconsin, announces the issuance of a new circular describing the Murray-Lorge Automatic Shut-Off Valve for use with flexible hose on air, steam, gas or various kinds of liquids.

035—STEAM OR VAPOR CLEANING

A new descriptive folder on steam or vapor cleaning has been issued by the Magnus Chemical Company, Garwood, New Jersey. The folder describes the Magnus vapor cleaner for use in any make of steam or vapor cleaning machine.

036—INDUSTRIAL FLOORS

Plants manufacturing metal products may be interested in a new bulletin published by Snead & Co., Jersey City, N.J., describing Armored industrial floors and how to have non-slippery yet smooth, substantial running surfaces.

037—REPAIRING AND RESURFACING FLOORS

A four-page Ruggedwear folder of the Flexrock Co., gives in detail the ways in which concrete breaks out, showing a method of repairing these broken places. Pictorial illustrations show how to resurface entire floors of concrete or wood construction.

038—SAFETY FOR WORKERS

A 16 page pamphlet by David Vaage, Chief of the Safety Service of the International Labor Organization, giving a rapid summary of the safety activities of that organization. Released from Geneva.

039—ORGANIZATION OF SAFETY SERVICES

A release of the International Labor Organization, reprinted from the "Industrial Safety Survey," Vol. XIV, No. 5, 1938. An article entitled "The Organization of Safety Services in Industrial Undertakings in the United States," by Lewis DeBlois.

040—INDUSTRIAL SAFETY GOGGLES

An informative, well-illustrated twenty-four page brochure on lenses and goggles, published by the New Era Optical Company.

041—INDUSTRIAL SAFETY

"A Guide to Industrial Efficiency and Safety" is the title of a folding catalog issued by the Martindale Electric Company of Cleveland, Ohio. The folder describes blower and cleaning equipment goggles, masks, stretcher cots, and other safety equipment as well as general electrical equipment items.

042—SAFETY GARMENTS

A Holcomb Safety Garment 32 page booklet illustrating and describing all types of safety garments. Contains data of interest and value to virtually every type of industrial concern.

043—CLEAN HANDS

"Proven Protection for Industry's Most Important Tools" is the title of a pamphlet

issued by the Sugar Beet Products Co. It presents some interesting facts about hand infections, their cost and prevention.

044—LIGHTING FIXTURES

The Pyle-National Company, Chicago, Illinois, has issued an eleven page bulletin illustrating and describing their Vaportight industrial lighting fixtures. The catalog includes descriptive data on guards, holders, reflectors, shades, and pylets.

045—UNIT HEATERS

Ratings, prices, speeds, constants and dimensions of the Carrier Corporation unit heaters; detailed tabulations cover propeller fan, single fan and two fan type heaters.

046—MAGNIFIERS AND READERS:

Twenty pages of descriptive material on Bausch & Lomb magnifiers, reading glasses and other optical products.

047—SPRAY EQUIPMENT:

A 32-page presentation by the Eclipse Air Company describing that company's guns, nozzles, exhaust equipment, agitators and compressors for use in all types of spraying operations. Specifications and photographs included.

048—WELDING REGULATIONS

Booklet giving the regulations of the National Board of Fire Underwriters covering the installation and operation of gas systems for welding and cutting purposes. Published by the National Fire Protective Association, 60 Batterymarch St., Boston, Mass.

NEW PRODUCTS

[*Continued from page 36*]

terials in the extinguishing liquid. The anti-freeze extinguishers are suitable for use outdoors or in unheated locations where plain water might freeze. The anti-freeze solution is made to withstand temperatures 72°F. below the normal freezing point of water. Both types of extinguishers hold 2½ gallons of extinguishing medium.

Every industry has its own problems to solve in preventing accidents. Due to the multiplicity of operations, hundreds of different hazards are encountered which make necessary a large variety of accident prevention equipment to protect workmen.

To aid in solving industry's protective problem, the American Optical Company, Southbridge, Mass., with more than a hundred years of experience in conserving and protecting eyesight, now announces a new line of high quality protective clothing, gloves, sleevelets, leggings, aprons, hats, and hoods. These products are available in a variety of materials used to protect workmen from heat, fire, acids, cuts, abrasions, etc. The materials used and the finished products are designed to give comfort and protection. A catalog is available explaining the features of this line in detail.

Nos. of desired items .....

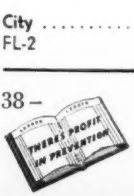
Firm Name .....

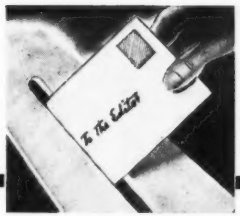
Your Name ..... Position .....

Street and Number of Your Firm .....

City ..... State .....

FL-2





THE QUESTION BOX

All questions from readers are answered by individual letters. A few of general interest are selected for publication. Information on any phase of industrial health or safety gladly supplied readers.

Patch Tests Indicated

SEVERAL employers who have worked in our tannery for many years without experiencing any skin trouble have within the past few weeks contracted what their doctors have diagnosed as a type of dermatoses but which, after an investigation in the plant, we cannot attribute to any particular item. We would be interested in any information you can supply on this problem.

T. R. A.—Pittsburgh

Your problem should be simple of solution by any good industrial physician, although some workers occasionally become allergic to substances that for years had no effect on them. Patch tests of all suspected substances should enable the physician to detect the guilty one or ones. Sumac, chromic acid and tannin; aniline, resins, formaldehyde or Titanum chloride, if you use them, they likely include the irritant.

Tank Ventilation

I have been having quite a bit of trouble in satisfactorily ventilating chrome plating tanks. Any information you can give me on the subject would be appreciated.

J. L. N.—Dayton

Studies of this and similar problems by health agencies recommended drawing off the air laterally through the top of the plating tanks. Ducts extending fully along one or more sides of the top of the tanks should be employed. They should be one to two inches wide and not be required to draw the air laterally more than about 18 inches. The ducts' air velocity should run about 2,000 feet per minute and the level of the plating solution should be at least eight inches below the top of the tank.

Toxic Dusts

We have had a difference of opinion in our factory as to what constitutes a toxic dust and what constitutes a nuisance dust. I wonder if you would be kind enough to settle this difference for us, and, incidentally, decide which of us buys the other a meal? *M. R. J., Ashland, Ky.*

We would like to be the third party to the meal (on the loser) without becoming too much involved in the argument. A nuisance dust is one that is generally associated with an increase in respiratory diseases (colds, bronchitis, pneumonia and tuberculosis). While such dusts may be discomforting to the worker and may be dangerous, they do not produce toxic effects or form fibrous tissues in the lungs. On the other hand, toxic dusts are usually considered to be the dust of poisonous materials, such as lead and arsenic or their compounds, that produce injuries to the organs (circulatory system, heart, liver, kidney, and nervous system). When a toxic dust is inhaled and deposited in the lungs it dissolves and is carried by the blood to all organs and tissues. Toxic dusts may also be deposited in the mouth and throat by ingestion.

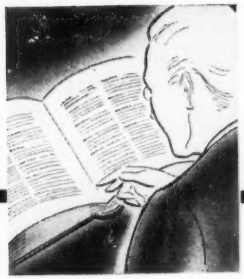
Impinger Method

What are the basic features of the impinger method for determining dust concentrations?

G. H. B., Kansas City, Mo.

[*Continued on page 40*]

NINE DOLLAR WORDS



Definitions of technical and medical terms, not in common lay use, perforce included in articles of this issue.

Abietic acid—An acid derived from the resin from the turpentine of certain species of fir trees.

Absenteeism—Lost time from sickness of all types.

Anaphylactoid—Substances having a tendency to increase the susceptibility to an infection. Opposite of immunity.

Cresol—A straw-colored liquid obtained from coal-tar. Its properties are similar to those of carbolic acid.

Erysipeloid—A mild dermatitis caused by infection.

Guanadines—Crystalline solids first obtained by the oxidation of guanin, a poisonous product of putrefaction.

Hexamethylenetetramine—(Methenamina) a condensation product obtained by the action of ammonia on formaldehyde, occuring in the form of white crystalline powder.

Hygroscopic agents—Acids, alkalis and other agents which take the water out of the skin.

Keratin—A substance present in cuticular structures such as hair, horns, nails, etc. It contains a relatively large amount of sulphur.

Monilia—A genus of moulds or fungi, fruit moulds.

Mordants—Substances, such as alum, used to make fast a dye or stain.

Napthalene—Tar camphor, a hydrocarbon obtained from coal-tar and crystallized.

Pustule—A small circumscribed elevation of the skin, containing pus.

Pyogenic—Pus-forming.

Pyrethrum—The root of a shrub native of Morocco, employed to increase the flow of the saliva.

Pyrogallol—A substance obtained from gallic acid by the action of heat, occurring as white shining needles, of bitter taste, soluble in water. Employed externally in the treatment of skin infections.

Toluene—A liquid obtained by the dry distillation of tolu, and also derived from coal-tar. Its physical and chemical properties resemble those of benzol.

The instruments generally used for the purpose of determining dust concentrations are the impinger, the konimeter and an electrical precipitator. The impinger is a device by which air is drawn through a small nozzle at high velocity and at a definite rate of flow. The small nozzle is pointed to force the dust particles to strike a glass plate immersed in water, alcohol, or a mixture of these liquids. The velocity of the dust flow causes the dust particles to be retained in the liquid. A sample of this liquid is then examined under a microscope and a count of the dust particles in the sample is made. The impinger can be used for determining dust concentrations of dust soluble in the liquid in which it is collected by evaporating the solution and determining the concentration by chemical means. As the impinger method collects dust from a large volume of air taken continuously over a long period of time, the results are representative of average conditions found in the area from which the sample is taken.

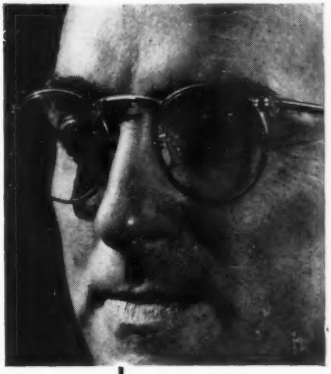
Keep Your Plant Clear of "Lost-Time Eyes" with

AMERICAN OPTICAL GOGGLES

Impose industry's 1937 eye-time loss on one plant . . . and it would be shut down for nearly 11 centuries. This represents only *recorded* eye-accidents . . . does not include the dozens and hundreds of minor or near-accidents that always precede a serious one . . . does not include time lost by eye-diseases caused or revived by injury.

Now here's the other side of the question: For the average cost of one lost eye, you could buy eye-protection for 1,000 men . . . *American Optical Eye-Protection* that is planned, economical, *backed by the only complete service.*

Call in the nearest representative.



Ful-Vue Goggles (patented) are popular with workers for their lightweight comfort and modern style. Patented 6-Curve Super Armorplate Lenses have extra impact-strength.

AMERICAN OPTICAL COMPANY

Manufacturers, for more than 100 years, of products to aid and protect vision. Factories at Southbridge, Mass. In Canada, Consolidated Optical Co., Ltd. Branch offices in all principal industrial centers.

M·S·A NEW STARS IN THE INDUSTRIAL SAFETY PICTURE

SHOWN FOR THE FIRST TIME AT THE SAFETY CONGRESS—NOW AVAILABLE FOR IMMEDIATE DELIVERY!

- ★ NEW MODEL DUSTFOE RESPIRATOR
- ★ DISPLACEMENT BLOWER HOSE MASKS
- ★ MIDGET IMPINGER FOR DUST SAMPLING
- ★ NEW HYDROGEN SULPHIDE CANISTER
- ★ EXPLOSIVE CARRIER (BAKELITE, WATERPROOF, NON-CONDUCTIVE)
- ★ ELECTROSTATIC DUST SAMPLER
- ★ HYDROGEN CYANIDE DETECTOR
- ★ NEW EDISON ELECTRIC HAND LAMP
- ★ METHANE TESTER
- ★ COMBINATION SKULLGARD—WELDING SHIELD
- ★ FIRE BLANKET OUTFIT
- ★ PROTECTIVE CAP-GOGGLE ASSEMBLY
- ★ COATED COVER GLASS FOR WELDERS' HELMETS
- ★ NEW LAMP BRACKET FOR PROTECTIVE HATS

These are the items that made *big news* at the Safety Congress . . that set tongues of safety men a-wagging . . . that kept our representatives working overtime on demonstrations for appreciative audiences!

Now these pace-setting latest M.S.A. developments are in regular production—ready for you! Send today for descriptive bulletins on the products in which you are interested . . . and let us arrange to demonstrate them on your own jobs . . . without obligation!

MINE SAFETY APPLIANCES CO.

BRADDOCK, THOMAS & MEADE STS., PITTSBURGH, PA.

District Representatives in Principal Cities